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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,689	12/22/2005	Martin John Hawkins Borley	TS1393 US	9758
23632	7590	08/12/2008		
SHELL OIL COMPANY			EXAMINER	
P O BOX 2463			BUL DUNG H	
HOUSTON, TX 772522463				
		ART UNIT	PAPER NUMBER	
		4153		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/561,689

Applicant(s)BORLEY, MARTIN JOHN
HAWKINS**Examiner**

DUNG BUI

Art Unit

4153

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/22/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because:
 - The abstract is more than one paragraph
 - The abstract contains legal phrases; in fact it is a copy of claim 1. Correction is required. See MPEP § 608.01(b).
 - Object to typo in specification, page 1, line 5, should be corrected to "US-A-4,208,384".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Confuorto et al. (US 6,551,565) in view of Shaw et al. (US 3,753,337).

Regarding claim 1, while Confuorto et al discloses a process to separate solids from a solids laden gaseous flow (column 4, lines 65-68 and column 5, lines 1-4; figure 3), the process comprising:

- (a) separating solids from the gaseous flow (figure 3, ref. 200) using a gas-solids separator (figure 3, ref. 22) resulting in a gaseous flow (figure 3, ref. 201) containing less than 50 mg/Nm^3 solids as Confuorto et al has a overlap range of less than 250 mg/Nm^3 (column 5, lines 1-4) and an underflow (figure 3, ref. 202) comprising the separated solids and part of the gaseous flow as fed to the gas-solids separator (column 5, lines 8-11)
- (b) separating part of the solids from the underflow in a cyclone (column 5, lines 9-16) wherein solids and a gaseous flow containing still some solids are obtained, and
- (d) combining the gaseous flows which are poor in solids as obtained in step (c) and as obtained in step (a) (figure 3, combining ref. 203 and 204); the reference does not disclose
- (c) contacting the gaseous flow obtained in step (b) with water to separate the solids and obtain a gaseous flow containing between 0 and 50 mg/Nm^3 solids.

Shaw et al discloses a gas cleaning system using a cyclone separator downstream interconnected with liquid curtains. Specifically, Shaw et al discloses that contacting the gaseous flow underflow obtained from a cyclone separator with water to separate the solids and obtain a gaseous flow (column 2, lines 35-39).

Confuorto et al and Shaw et al are analogous because both references are directed to gaseous separating system.

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide such a water separator, as taught by Shaw et al, in the system of Confuorto in order to removes excess solids from the cyclone separator as suggested by Shaw.

Regarding claims 1 and 2, Confuorto et al discloses the claimed invention except for a solids laden gaseous flow containing more than 100 mg/Nm^3 (instant claim 1) or $100\text{-}500 \text{ mg/Nm}^3$ (as in instant claim 2). It would have been obvious to one having ordinary skill in the art at the time of invention that Confuorto would start with at least 250 mg/Nm^3 which is greater than 100 mg/nm^3 since Confuorto discloses removing at least 250 mg/Nm^3 (col. 5 lines 1-4) since in order to remove that much it follows logically that the contaminated input stream must possess at least that much contaminant.

Regarding claim 1 part (c), Confuorto et al discloses the claimed invention except for contacting the gaseous flow obtained in step (b) with water to separate the solids and obtaining a gaseous flow containing between 0 and 50 mg/Nm^3 solids. It would have been obvious to one having ordinary skill in the art at the time the invention to optimize the output range of solids in a routine optimization of the process condition of the gas-solid separator, cyclone, and water separation steps in order to obtain the desired efficiency of exhaust gas. Such an optimization is well within the scope of one of ordinary skill, where the general conditions of a claim are disclosed by the prior art it

is not inventive to discover the optimum or workable ranges by routine experimentation, see *In re Aller* 105 USPQ 233,235.

Regarding claim 3, Confuorto et al. discloses all the claim limitations as set forth above.

Confuorto et al discloses the claimed invention except for the solids content in the gaseous flow as obtained in step (d) is between 10 and 50 mg/Nm³ solids. It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize process conditions, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, see *In re Aller*, 105 USPQ 233.

Regarding claim 4, Confuorto et al. discloses all the claim limitations as set forth above.

Confuorto et al discloses the gas-solid separator is a multi-separator vessel comprising of a plurality of parallel operated cyclonic gas-solids separators (column 4, lines 65-67 and column 5, lines 1-3).

Regarding claim 5, Confuorto et al. discloses all the claim limitations as set forth above.

Confuorto et al discloses the claimed invention except for the ratio of mass of water to mass of gas contacted in step (c) is between 1.5 and 2.0. It would have been obvious to one having ordinary skill in the art at the time the invention to have chosen a corresponding ratio of mass of water and mass of gas through a routine experimentation in order to obtain the washing efficiency required.

Regarding claims 6 and 7, Confuorto et al. discloses all the claim limitations as set forth above.

Confuorto et al discloses the claimed invention except for the solids content in the gas after contacting with water in step (c) is smaller than 50 mg/Nm^3 (claim 6), except for the solids content in the gas after contacting with water in step (c) is between $0 - 5 \text{ mg/Nm}^3$ (claim 7). It would have been obvious to one having ordinary skill in the art at the time the invention to optimize the process conditions to obtain the efficiency of the gas after contacting with water in step (c).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Confuorto et al (US 6,551,565) in view of Shaw et al as applied to claims 1-7 above, and further in view of Mitchell (US 4,208,384).

Regarding claim 8, Confuorto et al in view of Shaw discloses all the claim limitations as set forth above. While Confuorto et al in view of Shaw discloses a gas-solids separator is a multi-separator vessel comprising of a plurality of parallel cyclonic gas-solids separators (column 4, lines 65-67 and column 5, lines 1-3), they do not disclose the gas flow as obtained in step (a) is fed to a gas expander turbine and wherein step (d) is performed downstream said gas expander turbine. However, Mitchell discloses a gas-solids separator is a multi-separator vessel comprising of a plurality of parallel cyclonic gas-solids separators (figure 1, ref. 11 and column 2, lines 61-68 and column 3, lines 1-7). Specifically, Mitchell discloses a gas flow containing less than 50 mg/Nm^3 solids as obtained in step (a) is fed to a gas expander turbine and

wherein step (d) is performed downstream said gas expander turbine (figure 1, ref. 14 and column 2, lines 61-68 and column 3, lines 1-7).

Confuorto et al. and Mitchell are analogous because both references are directed to a fluidized catalytic cracking device containing gas-solids separators.

It would have been obvious to one having ordinary skill in the art at the time of invention to provide for the gas expander turbine of Confuorto et al (figure 1, ref. 14) in view of Shaw, as taught by Mitchell, to provide a conservation of energy and improving the biosphere in which we live.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Confuorto et al (US 6,551,565) in view of Shaw as applied to claims 1-8 above, and further in view of Mifflin et al (US 4,838,898).

Regarding claim 9, Confuorto et al discloses all the claim limitations as set forth above. While Confuorto et al in view of Shaw discloses a gas-solids separator is a multi-separator vessel comprising of a plurality of parallel cyclonic gas-solids separators (see Confuorto, column 4, lines 65-67 and column 5, lines 1-3), they do not disclose the solids as obtained in step (b) are continuously fed to a collecting vessel, from which vessel the solids are discharged non-continuously to the environment via a lock-hopper vessel.

Mifflin et al discloses a gas-solids separator is a multi-separator vessel comprising of a cyclonic gas-solids separator (figure 1, ref. 15). Specifically, Mifflin et al discloses the solids as obtained in step (b) are continuously fed to a collecting vessel

(figure 1, ref. 18), from which vessel the solids are discharged non-continuously to the environment via a lock-hopper vessel (figure 1, ref. 22).

Confuorto et al. and Mifflin et al are analogous because both references are directed to a process of removal laden solids containing third stage separators.

It would have been obvious to one having ordinary skill in the art at the time of invention to provide a collecting vessel, from which vessel the solids are discharged to a lock-hopper vessel of Confuorto et al in view of Shaw, as taught by Mifflin, to bring the solids from the elevated pressure level at which the process is operated to ambient pressure level (environment).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUNG BUI whose telephone number is (571)270-7077. The examiner can normally be reached on Mon. - Thurs., 7:30 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797
AU 4153 TA

DB